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**GOLDRATT<sup>UK</sup>**  
Knowledge that delivers™

# **Patient Flow in a Hospital Emergency Room**

Report by Maria Cristina Sierraalta from  
Venezuela

**Presented by Martin Powell**

## María Cristina Sierraalta

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- Mechanical Engineer
- 14 years experience in teaching TOC
- Responsible for implementation cases in Operations and Supply Chain in UK, Central Europe and Venezuela
- Director of Goldratt Solutions Ltd in the UK
- Faculty member of Goldratt Schools

mc.sierraalta@goldratt.co.uk

Mobile: +44 778719 1913

Office: +44 1234 834510

Skype: mcsierraalta





## Background – Health System in Venezuela

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- Venezuela has a mixture of public and private hospitals / clinics
- The majority of the users of the private hospitals are covered by insurance providers.
- The level of care and attention in the public system is lower than the private sector
- The private hospitals / clinics are owned by Doctors – most are not profitable as organisations
- The private hospitals / clinics usually have Emergency departments as people's insurance covers this type of care

This presentation is about the private sector where the hospitals (clinics) face the following challenges:

- 1.Growing demand for Emergency Services
- 2.Constant challenges from insurance companies (costs/cash)
- 3.Growing pressure from the government to control prices



## Two Hospitals take up the challenge with TOC

- In November 2011 under growing pressures, the first national conference on Health is held in Venezuela – some speakers from outside Venezuela are invited to share their experience
- Maria Cristina Sierraalta from Goldratt UK is invited to share how TOC has been used to improve the National Health Service in the UK
- After her presentation, many of the participants want to know more
- We selected two of them to be the spearhead sites for TOC in Health in Venezuela, where we would focus first on their biggest issue – the Emergency Rooms:
  - CENTRO MEDICO PASO REAL
  - CENTRO DE ESPECIALIDADES ANZOATEGUI, C.A. [CEACA]
- In both of these, the management of the level of service in the Emergency Rooms was below their expectations



## The Four Concepts of Flow\*

1. Improving flow (or equivalently lead time) is a primary objective of operational environments
2. This primary objective should be translated into a practical mechanism that protects the environment from being overloaded / over producing
3. Local efficiencies must be abolished
4. A focusing process to balance flow (remove disruptions) must be in place

When the environment is an “on-demand” service, with no due date nor an availability target and no valid way to choke the release of “work” – then concept 2 above is satisfied by maintaining protective capacity. The solution must then indicate which capacity is low.

\* Standing on the Shoulders of Giants – Eli Goldratt 2008

## The implementation solution

- Agree with the management/team that the Mindset is “Speed (of satisfying a patient’s clinical needs) is the prime driver for managing patient flow [On time performance is a primary measurement of effectiveness]” – Concept 1
- An Emergency Service Time Buffer is set to be challenging but achievable
- Patients are prioritised, first according to clinical need and then according to their buffer status through the use of Buffer Management Colour Priorities.
- Buffer management recovery actions are in place.
- Availability of the needed critical resources and facilities is monitored / managed.
- Black and Red Zone Buffer Penetration reasons (disruptions to flow) are subject to Pareto analysis periodically for Continuous Improvement.
- Improvement teams are taking actions on major disruptions to flow
- Capacity is monitored to identify CCR (Capacity Constrained Resources) and to manage these accordingly.



## Centro Medico Paso Real

This hospital is situated near Charallave, in Venezuela about 2 hours drive from Caracas. Opened in 1992 – as state of the art.

Owned by one Doctor and his family, who have invested significantly in ultra modern facilities, staff development and a sophisticated Hospital Enterprise System

With 2 operating theatres, about 500 employees and the following services:

- Emergency (28 beds)
- Surgical Areas
- Hospitalization (41 beds)
- Intensive Care Unit
- Clinical Nutrition Unit
- Coronary Care Unit
- Laboratory Services: Molecular Biology and Blood Bank
- Imaging Services: Magnetic Resonance Unit and Radiation





# TOC IMPLEMENTATION PROJECT



UBICACION:  EMERGENCIA ADULTOS  EMERGENCIA PEDIATRICA  AMBAS      PACIENTES EN TABLERO: **9**      **05/03/2012 08:19:28 AM**

Nº	PACIENTE	CUB	E..	HIST	MEDICO	ESTANCIA	RESTRICCIONES
1	PERAZA XIORANGEL		2	27656	LUDY CORREA PEREZ	0D 10H 56M	MEDICO RESIDENTE
2	CLARAMUNT JORBELIS GLEIMAR		12	27659		0D 0H 50M	
3	PAIVA MIGUEL ALEJANDRO		10	4768		0D 0H 43M	
4	MORENO YAZARIT SOFIA		2	26976		0D 0H 22M	
5	HERNANDEZ TAHYRA JOSEFINA		36	27060		0D 0H 17M	
6	MARQUEZ MARIA AQUILINA		75	24790		0D 0H 10M	
7	MARTINES JOSE ANTONIO	AD02	66	16868		0D 3H 0M	IMAGENES E INTERCONSU...
8	BARRETO NESTOR	AD10	36	27660		0D 0H 28M	
9	DEFFIT KIRA JUANITA	TSHO	43	27649	ARCADIA SANCHEZ MEDI...	0D 15H 35M	IMAGENES E INTERCONSU...



BRINDAMOS SERVICIOS DE SALUD EXCELENTES...



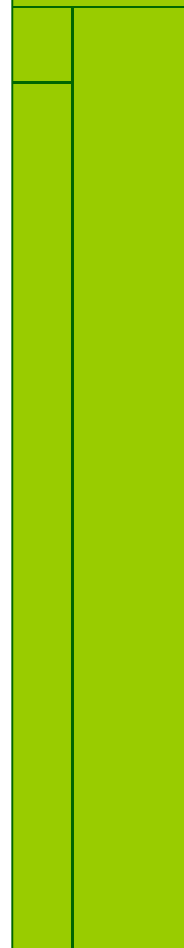
Emergency Time Buffer = 4 hours (as for UK)

# Results – week 1

Period	Days	No. cases	Cases/day	< 4 hours	< 4hours/day	%	Black	Black/day
28 feb - 4 mar	6	229	38	31	5	14%	198	33

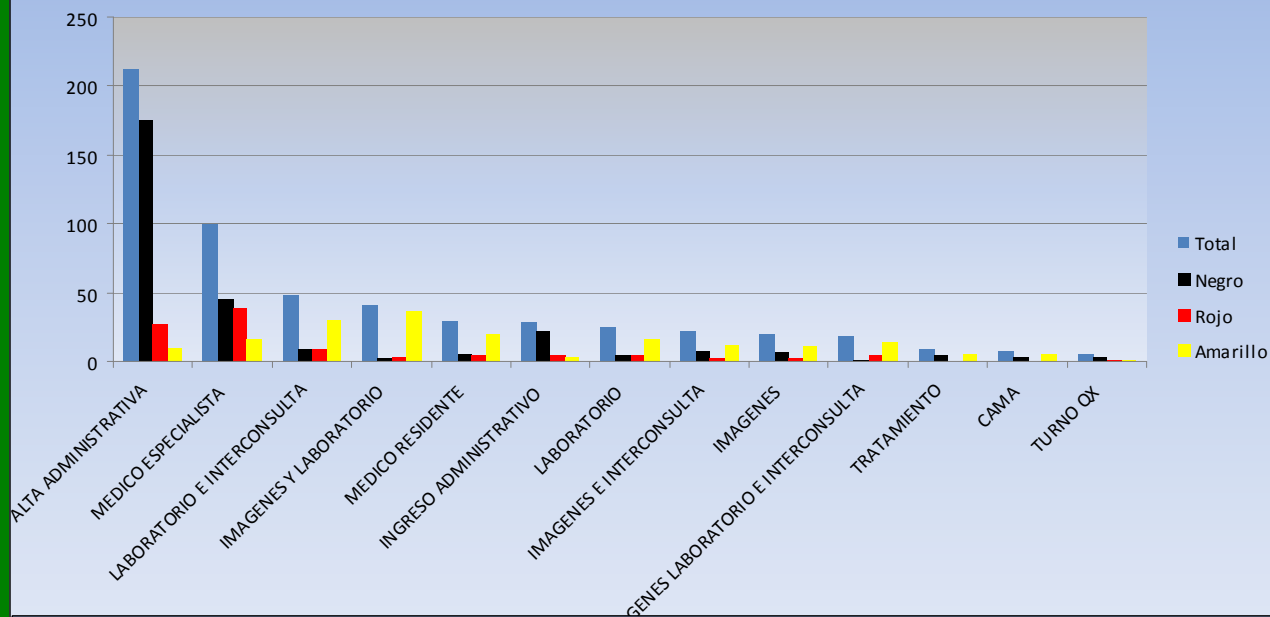


DELAYS 28/02 - 04/03	QTY	%
ADMINISTRATION RELEASE	213*	37%
SPECIALIST DOCTOR	100	18%
LAB TESTS & CONSULTATION	48	8%
XRAY & LAB TESTS	41	7%
RESIDENT DOCTOR	30	5%
ADMINISTRATION ADMITTANCE	29	5%
LAB TESTS	25	4%
XRAY & CONSULTATION	22	4%
XRAY RESULTS	20	4%
XRAY LAB TESTS & CONSULTATION	19	3%
MEDICAL TREATMENT	9	2%
BED	8	1%
XRAY QUEUE	5	1%

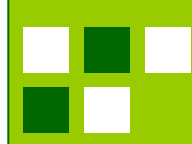
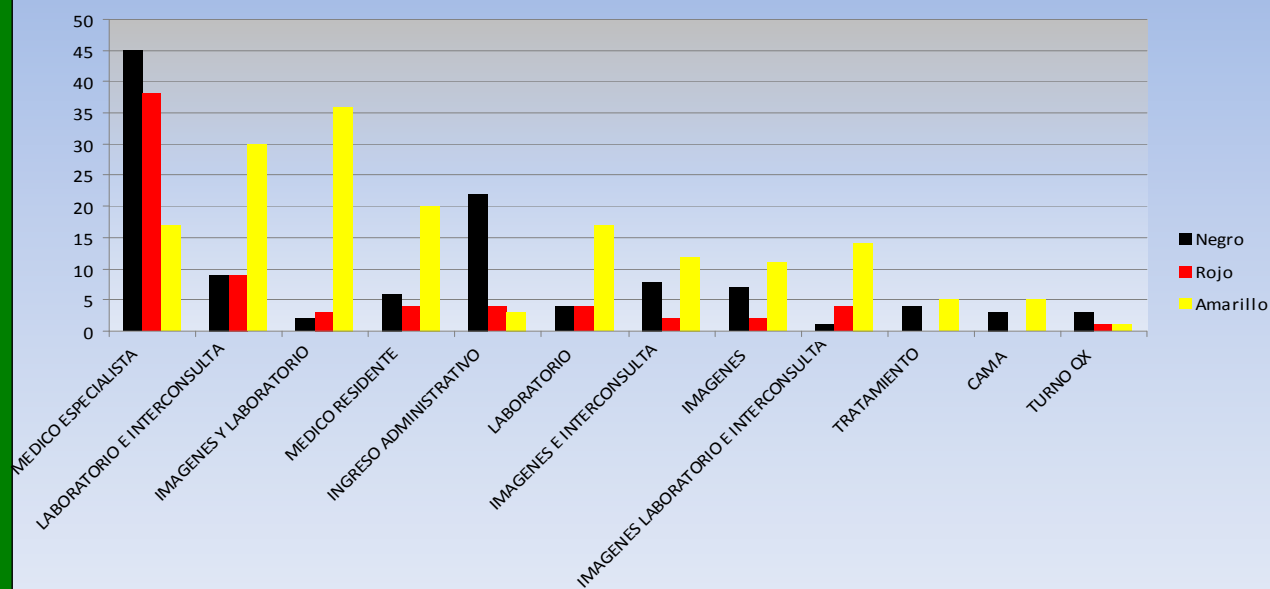




### ESTADISTICAS DEL 28/02/12 AL 04/03/2012



### ESTADISTICAS DEL 28/02/12 AL 04/03/2012



# Results in 2 weeks...



Period	Days	No. cases	Cases/day	< 4 hours	< 4hours/day	%	Black	Black/day
28 feb - 4 mar	6	229	38	31	5	14%	198	33
5 mar - 11 mar	7	337	48	273	39	81%	64	9
Improvement			1.26		7.8			-72%

DELAYS 28/02 - 04/03			DELAYS 5/03 - 11/03		
	QTY	%		QTY	%
ADMINISTRATION RELEASE	213	37%	ADMINISTRATION RELEASE	190	29%
SPECIALIST DOCTOR	100	18%	SPECIALIST DOCTOR	129	20%
LAB TESTS & CONSULTATION	48	8%	LAB TESTS & CONSULTATION	72	11%
XRAY & LAB TESTS	41	7%	XRAY LAB TESTS & CONSULTATION	48	7%
RESIDENT DOCTOR	30	5%	XRAY & CONSULTATION	43	7%
ADMINISTRATION ADMITTANCE	29	5%	RESIDENT DOCTOR	43	7%
LAB TESTS	25	4%	ADMINISTRATION ADMITTANCE	37	6%
XRAY & CONSULTATION	22	4%	LAB TESTS	29	4%
XRAY RESULTS	20	4%	XRAY & LAB TESTS	27	4%
XRAY LAB TESTS & CONSULTATION	19	3%	BED	17	3%
MEDICAL TREATMENT	9	2%	MEDICAL TREATMENT	11	2%
BED	8	1%	XRAY RESULTS	9	1%
XRAY QUEUE	5	1%	XRAY QUEUE	4	1%





## Feedback from the owner/head of Paso Real

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**Good Morning Maria Cristina**

**Sorry I didn't notice your phone call yesterday and your voice mail message from yesterday. I heard it very late last night.**

**Yesterday in the Management Meeting, Joel and Clara presented the TOC from last week in which the Pareto was inverted, 81% of patients were dealt with in less than 4 hours compared to 14% from the first week when we started with the screen....  
WONDERFUL!!**

**Congratulations to you and the professional team of the hospital which were able to achieve in such a small period of time this excellent result.**

**From the Medical Management of Centro Medico Paso Real, Ana Fernandez worked with each group of specialists in search of the attitudes and best practices to shorten the times.**

**1.- With the traumatologists, we ensured that the day of their emergency shift they did not work on their private practice dedicating full time to the emergency.**

**2.- We added a new specialist doctor in Internal Medicine with a fixed time table Monday to Friday from 8am until 2pm for the Emergency Services**

**3.- We are controlling that specialist Doctors on shift, have to be physically available in Surgery, Traumatology and Anaesthesiology.**

**Regarding the delay connected to ADMINISTRATIVE ADMITTANCE, we are evaluating actions to be taken:**

**Yesterday I spoke with the Quality Manager and ISO9001 consultant to prepare all the ISO DOCUMENTS connected to: PROCEDURES, PRACTICAL GUIDES, FORMATS, FUNCTIONS OF EACH POSITION, so everything is structured.**

**Thanks for your support and CONGRATULATIONS!!**

**Dr. Alberto Rasquin**

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## CEACA

This hospital is situated in Puerto La Cruz, in Venezuela about 1 hour flight from Caracas. Opened in 1971 – as state of the art.

Owned by 116 Doctors, under invested with modern but ageing facilities, some staff development and several computer systems which are not integrated – requirements passed by facsimile machines!!

With 5 operating theatres, over 700 employees and the following services:

- Emergency Service (28 beds) – no experience of using computers
- Surgical Areas
- Hospitalization (71 beds)
- Intensive Care Unit – both Adult and Infant
- Obstetrics and Psychiatry
- Laboratory Services
- Outpatient Clinics
- Imaging Services: Magnetic Resonance Unit and Radiation



C.E.A.C.A.

### Emergencia 1.0

#### Area de Atencion Emergencia

Nombres	Apellidos	O...	D...	Ath	Just	Tiem...	Ubic
ERZON EARVING	CABEZAS HIDALGO	8	D...			3h, 1...	B1
MARIA ANGEL	ARTEAGA OCHOA	14	M...			3h, 1...	B2
ILDEGAR JOSE	PEROZO HERNAND...	14				1h, 4...	A1
FREDDY ANTONIO	PEREZ	12				1h, 4...	A2
NAYLE DEL VALLE	BRITO ANDRCIA	0				1h, 4...	B3
WILMER ALEJANDRO	TROCONIS CONTRE...	16				1h, 4...	Ciru...
NIYIN ESGREIBER	MEDINA	6				1h, 2...	Y1
FRANKLIN JOSE	RODRIGUEZ MARCA...	3				1h, 4m	N1
ADEL JOSE	DE LEON SISO	3				53min	N2


**Mensaje**

Justificación de Espera por:

- 2-Procesar Solicitud (Rayos X - Lab - Otros)
- 3-Procesar Solicitud (Rayos X - Lab)
- 4-Procesar Solicitud (Rayos X - Otros)
- 5-Procesar Solicitud (Lab - Otros)
- 6-Procesar Solicitud Rayos X
- 7-Procesar Solicitud Lab
- 8-Procesar Solicitud Otros
- 9-Resultados (Rayos X - Lab - Otros)
- 10-Resultados (Rayos X - Lab)
- 11-Resultados (Rayos X - Otros)
- 12-Resultados (Lab - Otros)
- 13-Resultados Rayos X
- 14-Resultados Lab
- 15-Resultados Otros
- 16-Medico Especialista
- 17-Medicamentos (Farmacia)
- 18-Tramites Administrativos
- 19-Disponibilidad de Cama de Hospitalización
- 20-Camillero

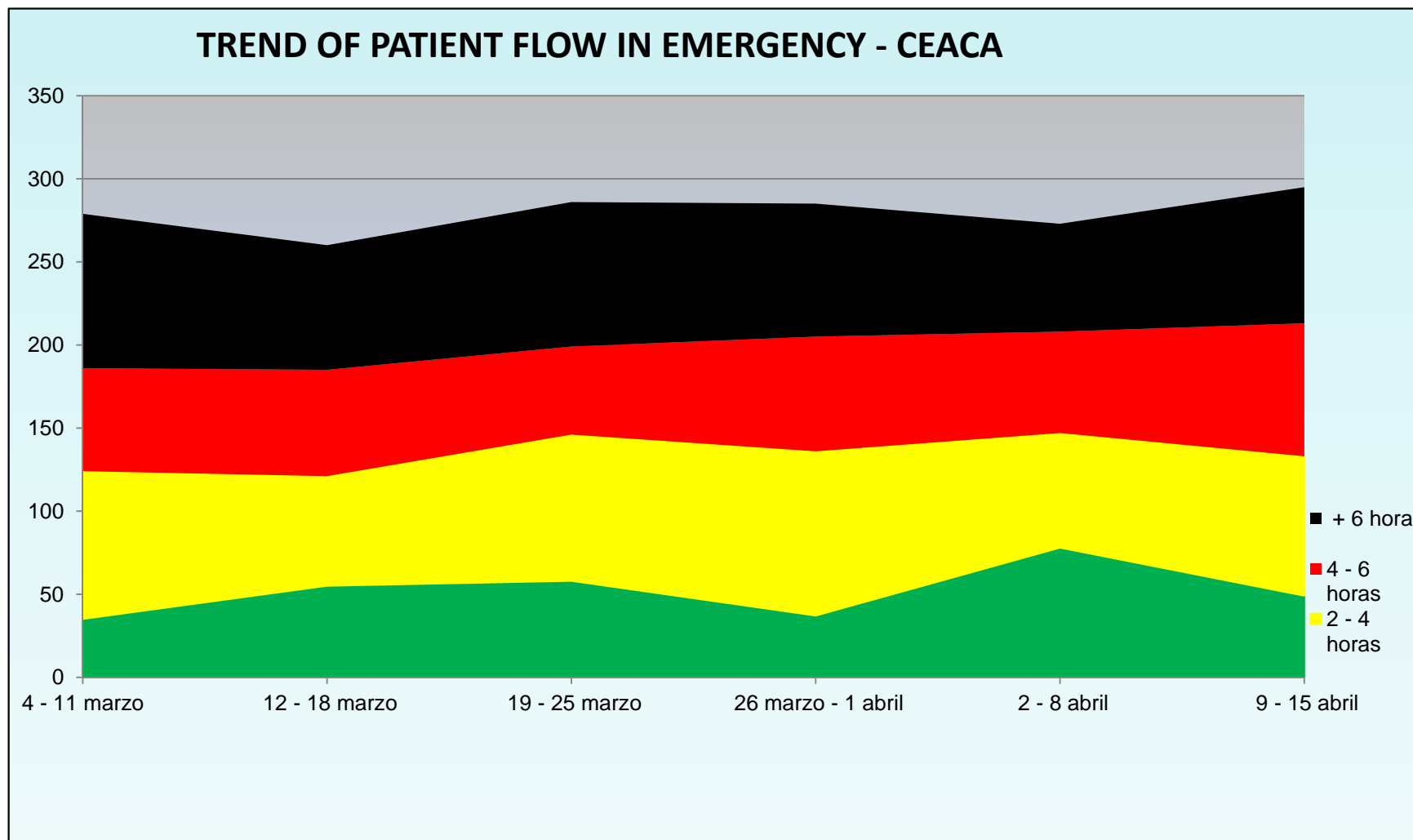
Aceptar

Emergency Time Buffer = 6 hours





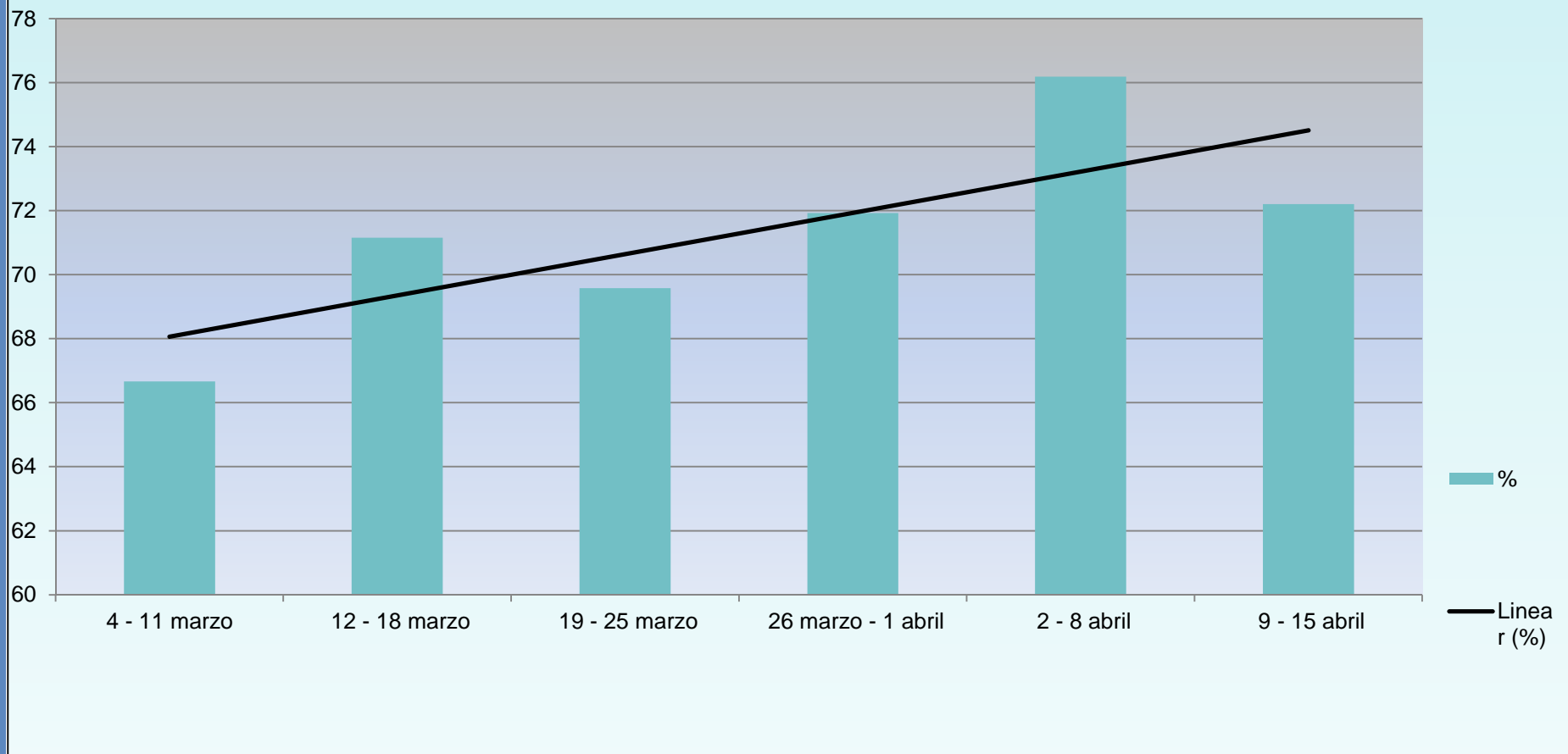
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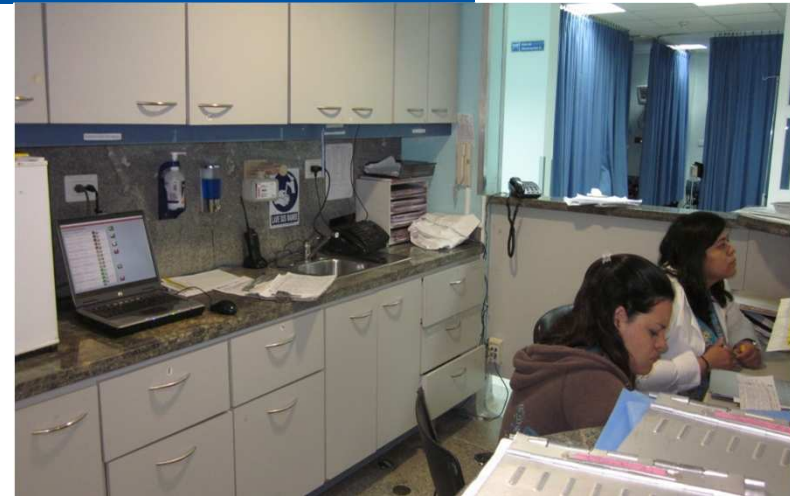




**C.E.A.C.A.**

**Percentage of Patients Attended to within 6 Hours**





**Area de Atencion Emergencia**

Nombre	Apellidos	O.	D.	Atn	Just	Tiem.	Ubic
ARMANDO JOSE	SANCHEZ CAICUTO	12	T.			18h.	B3
TAHIS CAROLINA	RODRIGUEZ GALLA	16				11h.	Ciru.
ELIAS JOSE	PINTO	6				6h. 4.	A3
AHINSA KARINA	MAZA SANCHEZ	16				5h. 1.	B4
JOSMAR DEL VALLE	SALAZAR LOPEZ	5				4h. 1.	A1
RUBEN WALTERIO	IGOR VARGAS	17				2h. 2.	B2
RODOLFO ENRIQUE	LUCIANO PINO	16				2h. 1.	B1
PATRICIA CAROLINA	ROJAS ROJAS	16				2h. 1.	Con.
FORTUNATO	HERRERA CARRE	4				2h. 3.	Trav.
EPIFANIO	MALAVE	9				2h. 1.	A3
MARIA DEMETRIA	MORALES DE CED.	0				1h. 5.	A4
MARIA DE LOURDES	RIVAS DE SILVA	5				1h. 2.	Y2
GHISELA ANDREINA	RAPINO DE VERA	2				47min	A1
NATACHA DE LOS A.	APARCEDO GARCIA	14				45min	A2
FRANCIS	PAHECO	0.				37min	Alexa



**C.E.A.C.A.**